

SEQUENCE LISTING

<110> Curtis, Rory A.J.

<120> 52906, 33408, AND 12189, NOVEL POTASSIUM
CHANNEL FAMILY MEMBERS AND USES THEREOF

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<151> 2000-06-06

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Gly Pro Ser Ser His Gln Gln Gln Glu Ser Pro Leu Pro Thr Ile Thr	
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His Cys Ala Gly Cys Thr Ala Trp Ser Pro Cys Ser Phe Asn Ser	
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Pro Asp Met Glu Thr Pro Leu Gln Phe Gln Arg Gly Phe Phe Pro Glu	
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Gln Gln Ser Gln Asp Lys Pro Cys Pro Pro Phe Ala Pro Leu Pro His		
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Pro His His Pro His Leu Ala His Gln Gln Pro Ala Ser Gly Gly		
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Ser Ser Pro Cys Leu Arg Cys Asn Ser Cys Ala Ser Ser Gly Ala Pro		
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Val Ser Glu Leu Thr Pro Ser Ser His Ala Ser Ala Leu Arg Gln Gln		
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Pro Ala His His Gln His Gln Pro Gln Ala Arg Arg Glu Ser Asn		
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Tyr Leu Ile Ala Arg Val Met Leu Leu His Ser Lys Leu Phe Thr Asp			
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Ala Cys Glu Arg Tyr His Asp Gln Gln Asp Val Thr Ser Asn Phe Leu			
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gac atg gta cct aac aca tac tgt gga aaa gga gtc tgc tta ctt act			2575
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Arg Lys Leu Glu Leu Thr Lys Ala Glu Lys His Val His Asn Phe Met			
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Ile Asp His Ala Lys Val Arg Lys His Gln Arg Lys Phe Leu Gln Ala			
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Ile His Gln Leu Arg Ser Val Lys Met Glu Gln Arg Lys Leu Asn Asp			
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Gln Ala Asn Thr Leu Val Asp Leu Ala Lys Thr Gln Asn Ile Met Tyr			

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760	765	770	
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Arg Gly Phe Phe Pro Glu Gln Pro Pro Pro Pro Arg Ser Ser His			
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 Arg Gly Ser Gln Leu Asn Val Ser Glu Leu Thr Pro Ser Ser His Ala
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 Ser Ala Leu Arg Gln Gln Tyr Ala Gln Gln Ser Ala Gln Gln Ser Ala
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 Ser Ala Ser Gln Tyr His Gln Cys His Ser Leu Gln Pro Ala Ala Ser
 210 215 220
 Pro Thr Gly Ser Leu Gly Ser Leu Gly Ser Gly Pro Pro Leu Ser His
 225 230 235 240
 His His His Pro His Pro Ala His His Gln His His Gln Pro Gln
 245 250 255
 Ala Arg Arg Glu Ser Asn Pro Phe Thr Glu Ile Ala Met Ser Ser Cys
 260 265 270
 Arg Tyr Asn Gly Gly Val Met Arg Pro Leu Ser Asn Leu Ser Ala Ser
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 Pro Ala Ser Val Gly Gly Gly Gly Ala Ser Ser Pro Ser Ala Ala
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 325 330 335
 Ser Lys Pro Glu His Asn Asn Ser Asn Asn Leu Ala Leu Tyr Gly Thr
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 Gly Gly Gly Ser Thr Gly Gly Gly Gly Gly Gly Ser Gly
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 Arg Leu Ser Asp Tyr Ala Leu Ile Phe Gly Met Phe Gly Ile Val Val
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Gly Val Cys Leu Leu Thr Gly Ile Met Gly Ala Gly Cys Thr Ala Leu		
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Val Val Ala Val Val Ala Arg Lys Leu Glu Leu Thr Lys Ala Glu Lys		
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His Val His Asn Phe Met Met Asp Thr Gln Leu Thr Lys Arg Val Lys		
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Asn Ala Ala Ala Asn Val Leu Arg Glu Thr Trp Leu Ile Tyr Lys Asn		
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Thr Lys Leu Val Lys Lys Ile Asp His Ala Lys Val Arg Lys His Gln		
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Arg Lys Phe Leu Gln Ala Ile His Gln Leu Arg Ser Val Lys Met Glu		
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Gln Arg Lys Leu Asn Asp Gln Ala Asn Thr Leu Val Asp Leu Ala Lys		
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Gly Leu Val Ala Pro Gln Asn Thr Phe Leu Glu Asn Ile Val Arg Arg	
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Ser Ser Glu Ser Ser Phe Leu Leu Gly Asn Ala Gln Ile Val Asp Trp	
25 30 35	

cct gta gtt tat agt aat gac ggt ttt tgt aaa ctc tct gga tat cat	439
Pro Val Val Tyr Ser Asn Asp Gly Phe Cys Lys Leu Ser Gly Tyr His	
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Arg Ala Asp Val Met Gln Lys Ser Ser Thr Cys Ser Phe Met Tyr Gly	

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75	80		85	
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90	95		100	
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170	175		180	
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200	205		210	
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235	240		245	
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250	255		260	
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265	270		275	
tct gac cct aag ctc ata agg atg aac tat ctg aaa act tgg ttt gtg Ser Asp Pro Lys Leu Ile Arg Met Asn Tyr Leu Lys Thr Trp Phe Val				1159
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Thr Pro Ile Gln Thr Ser Leu Ala Tyr Val Lys Thr Ser Glu Ser Leu			
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Lys Gln Asn Asn Arg Asp Ala Met Glu Leu Lys Pro Asn Gly Gly Ala			
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Asn Gly Lys Gly Trp Leu Arg Leu Lys Asn Asn Met Gly Ala His Glu			
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Glu Lys Lys Glu Asp Trp Asn Asn Val Thr Lys Ala Glu Ser Met Gly			
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Leu Leu Ser Glu Asp Pro Lys Ser Ser Asp Ser Glu Asn Ser Val Thr			
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Lys Asn Pro Leu Arg Lys Thr Asp Ser Cys Asp Ser Gly Ile Thr Lys			
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Ser Asp Leu Arg Leu Asp Lys Ala Gly Glu Ala Arg Ser Pro Leu Glu			
875	880	885	
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His Ser Pro Ile Gln Ala Asp Ala Lys His Pro Phe Tyr Pro Ile Pro			
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Glu Gln Ala Leu Gln Thr Thr Leu Gln Glu Val Lys His Glu Leu Lys			
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Val Ala Glu Ile Leu Lys Ile Leu Ser Glu Lys Ser Val Pro Gln Ala			
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Ser Ser Pro Lys Ser Gln Met Pro Leu Gln Val Pro Pro Gln Ile Pro			
955	960	965	
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970

975

980

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 Lys Asp Glu Ile His Phe
 985

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Lys	Leu	Ser	Gly	Tyr	His	Arg	Ala	Asp	Val	Met	Gln	Lys	Ser	Ser	Thr
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Cys	Ser	Phe	Met	Tyr	Gly	Glu	Leu	Thr	Asp	Lys	Lys	Thr	Ile	Glu	Lys
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Pro	Ile	Arg	Asn	Glu	His	Glu	Lys	Val	Val	Leu	Phe	Leu	Cys	Thr	Phe
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Gly	Trp	Thr	Lys	Phe	Ala	Arg	Leu	Thr	Arg	Ala	Leu	Thr	Asn	Ser	Arg
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Ser	Val	Leu	Gln	Gln	Leu	Thr	Pro	Met	Asn	Lys	Thr	Glu	Val	Val	His
165							170					175			

Lys	His	Ser	Arg	Leu	Ala	Glu	Val	Leu	Gln	Leu	Gly	Ser	Asp	Ile	Leu
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Pro	Gln	Tyr	Lys	Gln	Glu	Ala	Pro	Lys	Thr	Pro	Pro	His	Ile	Ile	Leu
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His	Tyr	Cys	Ala	Phe	Lys	Thr	Thr	Trp	Asp	Trp	Val	Ile	Leu	Ile	Leu
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Thr	Phe	Tyr	Thr	Ala	Ile	Met	Val	Pro	Tyr	Asn	Val	Ser	Phe	Lys	Thr
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Lys	Gln	Asn	Asn	Ile	Ala	Trp	Leu	Val	Leu	Asp	Ser	Val	Val	Asp	Val
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Ile	Phe	Leu	Val	Asp	Ile	Val	Leu	Asn	Phe	His	Thr	Thr	Phe	Val	Gly
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Pro	Gly	Gly	Glu	Val	Ile	Ser	Asp	Pro	Lys	Leu	Ile	Arg	Met	Asn	Tyr
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Leu	Lys	Thr	Trp	Phe	Val	Ile	Asp	Leu	Leu	Ser	Cys	Leu	Pro	Tyr	Asp
290							295				300				

Ile	Ile	Asn	Ala	Phe	Glu	Asn	Val	Asp	Glu	Gly	Ile	Ser	Ser	Leu	Phe
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 Ile Arg Met Lys Asn Gly Asn Gly Lys Trp Leu Arg Leu Lys Asn
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 Asn Met Gly Ala His Glu Glu Lys Lys Glu Asp Trp Asn Asn Val Thr
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 850 855 860
 Asp Ser Gly Ile Thr Lys Ser Asp Leu Arg Leu Asp Lys Ala Gly Glu
 865 870 875 880
 Ala Arg Ser Pro Leu Glu His Ser Pro Ile Gln Ala Asp Ala Lys His
 885 890 895
 Pro Phe Tyr Pro Ile Pro Glu Gln Ala Leu Gln Thr Thr Leu Gln Glu
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 Val Lys His Glu Leu Lys Glu Asp Ile Gln Leu Leu Ser Cys Arg Met
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 930 935 940
 Lys Ser Val Pro Gln Ala Ser Ser Pro Lys Ser Gln Met Pro Leu Gln
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 Arg Ala Arg Thr Leu Gly Arg Phe Pro Asp Thr Leu Leu Gly Asp Pro
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 Ala Arg Arg Gly Arg Phe Tyr Asp Asp Ala Arg Arg Glu Tyr Phe Phe
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Arg Ala Phe Ala Arg Gln Leu Cys Leu Leu Phe Glu Phe Pro Glu Ser				
115 120 125				
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Ser Gln Ala Ala Arg Val Leu Ala Val Val Ser Val Leu Val Ile Leu				
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Val Ser Ile Val Val Phe Cys Leu Glu Thr Leu Pro Asp Phe Arg Asp				
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Trp Phe Ser Phe Glu Leu Leu Val Arg Leu Leu Val Cys Pro Ser Lys				
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Val Arg Val Phe Arg Ile Phe Lys Leu Ser Arg His Ser Lys Gly Leu				
275 280 285				
caa atc ttg ggc cag acg ctt cgg gcc tcc atg cgt gag ctg ggc ctc				912
Gln Ile Leu Gly Gln Thr Leu Arg Ala Ser Met Arg Glu Leu Gly Leu				
290 295 300				

ctc atc ttt ttc ctc ttc atc ggt gtg gtc ctc ttt tcc agc gcc gtc		960
Leu Ile Phe Phe Leu Phe Ile Gly Val Val Leu Phe Ser Ser Ala Val		
305 310 315 320		
tac ttt gcc gaa gtt gac cggt gtg gac tcc cat ttc act agc atc cct		1008
Tyr Phe Ala Glu Val Asp Arg Val Asp Ser His Phe Thr Ser Ile Pro		
325 330 335		
gag tcc ttc tgg tgg gcg gta gtc acc atg act aca gtt ggc tat gga		1056
Glu Ser Phe Trp Trp Ala Val Val Thr Met Thr Thr Val Gly Tyr Gly		
340 345 350		
gac atg gca ccc gtc act gtg ggt ggc aag ata gtg ggc tct ctg tgt		1104
Asp Met Ala Pro Val Thr Val Gly Gly Lys Ile Val Gly Ser Leu Cys		
355 360 365		
gcc att gcg ggc gtg ctg act att tcc ctg cca gtg ccc gtc att gtc		1152
Ala Ile Ala Gly Val Leu Thr Ile Ser Leu Pro Val Pro Val Ile Val		
370 375 380		
tcc aat ttc agc tac ttt tat cac cggt gag aca gag ggc gaa gag gct		1200
Ser Asn Phe Ser Tyr Phe Tyr His Arg Glu Thr Glu Gly Glu Ala		
385 390 395 400		
ggg atg ttc agc cat gtg gac atg cag cct tgt ggc cca ctg gag ggc		1248
Gly Met Phe Ser His Val Asp Met Gln Pro Cys Gly Pro Leu Glu Gly		
405 410 415		
aag gcc aat ggg ggg ctg gtg gac ggg gag gta cct gag cta cca cct		1296
Lys Ala Asn Gly Gly Leu Val Asp Gly Glu Val Pro Glu Leu Pro Pro		
420 425 430		
cca ctc tgg gca ccc cca ggg aaa cac ctg gtc acc gaa gtg		1338
Pro Leu Trp Ala Pro Pro Gly Lys His Leu Val Thr Glu Val		
435 440 445		
tga		1341
<210> 8		
<211> 446		
<212> PRT		
<213> Homo sapiens		
<400> 8		
Cys Cys Glu Arg Leu Val Leu Asn Val Ala Gly Leu Arg Phe Glu Thr		
1 5 10 15		
Arg Ala Arg Thr Leu Gly Arg Phe Pro Asp Thr Leu Leu Gly Asp Pro		
20 25 30		
Ala Arg Arg Gly Arg Phe Tyr Asp Asp Ala Arg Arg Glu Tyr Phe Phe		
35 40 45		
Asp Arg His Arg Pro Ser Phe Asp Ala Val Leu Tyr Tyr Tyr Gln Ser		
50 55 60		
Gly Gly Arg Leu Arg Arg Pro Ala His Val Pro Leu Asp Val Phe Leu		
65 70 75 80		
Glu Glu Val Ala Phe Tyr Gly Leu Gly Ala Ala Ala Leu Ala Arg Leu		
85 90 95		

Arg Glu Asp Glu Gly Cys Pro Val Pro Pro Glu Arg Pro Leu Pro Arg
 100 105 110
 Arg Ala Phe Ala Arg Gln Leu Cys Leu Leu Phe Glu Phe Pro Glu Ser
 115 120 125
 Ser Gln Ala Ala Arg Val Leu Ala Val Val Ser Val Leu Val Ile Leu
 130 135 140
 Val Ser Ile Val Val Phe Cys Leu Glu Thr Leu Pro Asp Phe Arg Asp
 145 150 155 160
 Asp Arg Asp Gly Thr Gly Leu Ala Ala Ala Ala Ala Gly Pro Phe
 165 170 175
 Pro Ala Pro Leu Asn Gly Ser Ser Gln Met Pro Gly Asn Pro Pro Arg
 180 185 190
 Leu Pro Phe Asn Asp Pro Phe Phe Val Val Glu Thr Leu Cys Ile Cys
 195 200 205
 Trp Phe Ser Phe Glu Leu Leu Val Arg Leu Leu Val Cys Pro Ser Lys
 210 215 220
 Ala Ile Phe Phe Lys Asn Val Met Asn Leu Ile Asp Phe Val Ala Ile
 225 230 235 240
 Leu Pro Tyr Phe Val Ala Leu Gly Thr Glu Leu Ala Arg Gln Arg Gly
 245 250 255
 Val Gly Gln Gln Ala Met Ser Leu Ala Ile Leu Arg Val Ile Arg Leu
 260 265 270
 Val Arg Val Phe Arg Ile Phe Lys Leu Ser Arg His Ser Lys Gly Leu
 275 280 285
 Gln Ile Leu Gly Gln Thr Leu Arg Ala Ser Met Arg Glu Leu Gly Leu
 290 295 300
 Leu Ile Phe Phe Leu Phe Ile Gly Val Val Leu Phe Ser Ser Ala Val
 305 310 315 320
 Tyr Phe Ala Glu Val Asp Arg Val Asp Ser His Phe Thr Ser Ile Pro
 325 330 335
 Glu Ser Phe Trp Trp Ala Val Val Thr Met Thr Thr Val Gly Tyr Gly
 340 345 350
 Asp Met Ala Pro Val Thr Val Gly Gly Lys Ile Val Gly Ser Leu Cys
 355 360 365
 Ala Ile Ala Gly Val Leu Thr Ile Ser Leu Pro Val Pro Val Ile Val
 370 375 380
 Ser Asn Phe Ser Tyr Phe Tyr His Arg Glu Thr Glu Gly Glu Ala
 385 390 395 400
 Gly Met Phe Ser His Val Asp Met Gln Pro Cys Gly Pro Leu Glu Gly
 405 410 415
 Lys Ala Asn Gly Gly Leu Val Asp Gly Glu Val Pro Glu Leu Pro Pro
 420 425 430
 Pro Leu Trp Ala Pro Pro Gly Lys His Leu Val Thr Glu Val
 435 440 445

<210> 9

<211> 223

<212> PRT

<213> Artificial Sequence

<220>

<223> consensus sequence

<400> 9

Ile Leu Phe Ile Leu Asp Leu Leu Phe Val Leu Leu Phe Leu Leu Glu
 1 5 10 15
 Ile Val Leu Lys Phe Ile Ala Tyr Gly Leu Lys Ser Thr Ser Asn Ile

20	25	30	
Ala Ala Lys Tyr Leu Lys Ser Ile Phe Asn Ile Leu Asp Leu Leu Ala			
35	40	45	
Ile Leu Pro Leu Leu Leu Leu Val Leu Phe Leu Ser Gly Thr Glu			
50	55	60	
Gln Val Ala Lys Lys Arg Leu Arg Glu Arg Phe Ser Leu Glu Leu Ser			
65	70	75	80
Gln Trp Tyr Tyr Arg Ile Leu Arg Phe Leu Arg Leu Leu Arg Leu Leu			
85	90	95	
Arg Leu Leu Arg Leu Leu Arg Leu Leu Arg Arg Leu Glu Thr Leu Phe			
100	105	110	
Glu Phe Glu Leu Gly Thr Leu Ala Trp Ser Leu Gln Ser Leu Gly Arg			
115	120	125	
Ala Leu Lys Ser Ile Leu Arg Phe Leu Leu Leu Leu Leu Leu Leu Leu			
130	135	140	
Ile Gly Phe Ser Val Ile Gly Tyr Leu Leu Phe Lys Gly Tyr Glu Asp			
145	150	155	160
Leu Ser Glu Asn Glu Val Asp Gly Asn Ser Glu Phe Ser Ser Tyr Phe			
165	170	175	
Asp Ala Phe Tyr Phe Leu Phe Val Thr Leu Thr Thr Val Gly Phe Gly			
180	185	190	
Asp Leu Val Pro Val Trp Leu Gly Ile Ile Phe Phe Val Leu Phe Phe			
195	200	205	
Ile Ile Val Gly Leu Leu Leu Asn Leu Leu Ile Ala Val Ile			
210	215	220	

<210> 10

<211> 120

<212> PRT

<213> Artificial Sequence

<220>

<223> consensus sequence

<400> 10

Ala Leu Glu Glu Arg Ser Tyr Pro Ala Gly Glu Val Ile Ile Arg Gln			
1	5	10	15

Gly Asp Pro Gly Asp Ser Phe Tyr Ile Val Leu Ser Gly Glu Val Glu		
20	25	30

Val Tyr Lys Leu Thr Glu Asp Gly Ala Arg Thr Pro Glu Val Ser Gln		
35	40	45

Lys Gln Asp Thr Arg Glu Gln Val Val Ala Thr Leu Gly Pro Gly Asp		
50	55	60

Phe Phe Gly Glu Leu Ala Leu Leu Thr Asn Asp Gly Asn Lys Asn Ala			
65	70	75	80

Val Leu Pro Ser Leu Asp Gln Gly Ala Pro Arg Thr Ala Thr Val Arg		
85	90	95

Ala Leu Thr Asp Ser Glu Leu Leu Arg Leu Asp Arg Glu Asp Phe Arg		
100	105	110

Arg Leu Leu Gln Lys Tyr Pro Glu		
115	120	

<210> 11

<211> 111

<212> PRT

<213> Artificial Sequence

<220>
<223> consensus sequence

<400> 11
 Glu Arg Val Arg Leu Asn Val Gly Gly Lys Arg Phe Glu Thr Ser Lys
 1 5 10 15
 Ser Thr Leu Thr Arg Phe Lys Pro Asp Thr Leu Leu Gly Arg Leu Leu
 20 25 30
 Lys Thr Asp Ser Asp Val His Glu Ala Arg Leu Arg Leu Cys Asp Phe
 35 40 45
 Tyr Asp Asp Glu Thr Gly Glu Tyr Phe Asp Arg Ser Pro Lys His
 50 55 60
 Phe Glu Thr Ile Leu Asn Phe Tyr Arg Thr Gly Asp Gly Lys Leu His
 65 70 75 80
 Arg Pro Glu Val Cys Leu Asp Ser Phe Leu Glu Glu Leu Glu Phe Tyr
 85 90 95
 Gly Leu Asp Glu Leu Ala Ile Glu Ser Cys Cys Glu Asp Glu Tyr
 100 105 110

<210> 12

<211> 988

<212> PRT

<213> Rattus norvegicus

<400> 12
 Met Pro Gly Gly Lys Arg Gly Leu Val Ala Pro Gln Asn Thr Phe Leu
 1 5 10 15
 Glu Asn Ile Val Arg Arg Ser Ser Glu Ser Ser Phe Leu Leu Gly Asn
 20 25 30
 Ala Gln Ile Val Asp Trp Pro Val Val Tyr Ser Asn Asp Gly Phe Cys
 35 40 45
 Lys Leu Ser Gly Tyr His Arg Ala Asp Val Met Gln Lys Ser Ser Thr
 50 55 60
 Cys Ser Phe Met Tyr Gly Glu Leu Thr Asp Lys Lys Thr Ile Glu Lys
 65 70 75 80
 Val Arg Gln Thr Phe Asp Asn Tyr Glu Ser Asn Cys Phe Glu Val Leu
 85 90 95
 Leu Tyr Lys Lys Asn Arg Thr Pro Val Trp Phe Tyr Met Gln Ile Ala
 100 105 110
 Pro Ile Arg Asn Glu His Glu Lys Val Val Leu Phe Leu Cys Thr Phe
 115 120 125
 Lys Asp Ile Thr Leu Phe Lys Gln Pro Ile Glu Asp Asp Ser Thr Lys
 130 135 140
 Gly Trp Thr Lys Phe Ala Arg Leu Thr Arg Ala Leu Thr Asn Ser Arg
 145 150 155 160
 Ser Val Leu Gln Gln Leu Thr Pro Met Asn Lys Thr Glu Thr Val His
 165 170 175
 Lys His Ser Arg Leu Ala Glu Val Leu Gln Leu Gly Ser Asp Ile Leu
 180 185 190
 Pro Gln Tyr Lys Gln Glu Ala Pro Lys Thr Pro Pro His Ile Ile Leu
 195 200 205
 His Tyr Cys Ala Phe Lys Thr Thr Trp Asp Trp Val Ile Leu Ile Leu
 210 215 220
 Thr Phe Tyr Thr Ala Ile Met Val Pro Tyr Asn Val Ser Phe Lys Thr
 225 230 235 240
 Lys Gln Asn Asn Ile Ala Trp Leu Val Leu Asp Ser Val Val Asp Val
 245 250 255

Ile Phe Leu Val Asp Ile Val Leu Asn Phe His Thr Thr Phe Val Gly
 260 265 270
 Pro Gly Gly Glu Val Ile Ser Asp Pro Lys Leu Ile Arg Met Asn Tyr
 275 280 285
 Leu Lys Thr Trp Phe Val Ile Asp Leu Leu Ser Cys Leu Pro Tyr Asp
 290 295 300
 Ile Ile Asn Ala Phe Glu Asn Val Asp Glu Gly Ile Ser Ser Leu Phe
 305 310 315 320
 Ser Ser Leu Lys Val Val Arg Leu Leu Arg Leu Gly Arg Val Ala Arg
 325 330 335
 Lys Leu Asp His Tyr Leu Glu Tyr Gly Ala Ala Val Leu Val Leu Leu
 340 345 350
 Val Cys Val Phe Gly Leu Val Ala His Trp Leu Ala Cys Ile Trp Tyr
 355 360 365
 Ser Ile Gly Asp Tyr Glu Val Ile Asp Glu Val Thr Asn Thr Ile Gln
 370 375 380
 Ile Asp Ser Trp Leu Tyr Gln Leu Ala Leu Ser Ile Arg Thr Pro Tyr
 385 390 395 400
 Arg Tyr Asn Thr Ser Ala Gly Ile Trp Glu Gly Gly Pro Ser Lys Asp
 405 410 415
 Ser Leu Tyr Val Ser Ser Leu Tyr Phe Thr Met Thr Ser Leu Thr Thr
 420 425 430
 Ile Gly Phe Gly Asn Ile Ala Pro Thr Thr Asp Val Glu Lys Met Phe
 435 440 445
 Ser Val Ala Met Met Met Val Gly Ser Leu Leu Tyr Ala Thr Ile Phe
 450 455 460
 Gly Asn Val Thr Thr Ile Phe Gln Gln Met Tyr Ala Asn Thr Asn Arg
 465 470 475 480
 Tyr His Glu Met Leu Asn Asn Val Arg Asp Phe Leu Lys Leu Tyr Gln
 485 490 495
 Val Pro Lys Gly Leu Ser Glu Arg Val Met Asp Tyr Ile Val Ser Thr
 500 505 510
 Trp Ser Met Ser Lys Gly Ile Asp Thr Glu Lys Val Leu Ser Ile Cys
 515 520 525
 Pro Lys Asp Met Arg Ala Asp Ile Cys Val His Leu Asn Arg Lys Val
 530 535 540
 Phe Asn Glu His Pro Ala Phe Arg Leu Ala Ser Asp Gly Cys Leu Arg
 545 550 555 560
 Ala Leu Ala Val Glu Phe Gln Thr Ile His Cys Ala Pro Gly Asp Leu
 565 570 575
 Ile Tyr His Ala Gly Glu Ser Val Asp Ala Leu Cys Phe Val Val Ser
 580 585 590
 Gly Ser Leu Glu Val Ile Gln Asp Glu Glu Val Val Ala Ile Leu Gly
 595 600 605
 Lys Gly Asp Val Phe Gly Asp Ile Phe Trp Lys Glu Thr Thr Leu Ala
 610 615 620
 His Ala Cys Ala Asn Val Arg Ala Leu Thr Tyr Cys Asp Leu His Ile
 625 630 635 640
 Ile Lys Arg Glu Ala Leu Leu Lys Val Leu Asp Phe Tyr Thr Ala Phe
 645 650 655
 Ala Asn Ser Phe Ser Arg Asn Leu Thr Leu Thr Cys Asn Leu Arg Lys
 660 665 670
 Arg Ile Ile Phe Arg Lys Ile Ser Asp Val Lys Lys Glu Glu Glu
 675 680 685
 Arg Leu Arg Gln Lys Asn Glu Val Thr Leu Ser Ile Pro Val Asp His
 690 695 700
 Pro Val Arg Lys Leu Phe Gln Lys Phe Lys Gln Gln Lys Glu Leu Arg

705 710 715 720
 Asn Gln Gly Ser Ala Gln Ser Asp Pro Glu Arg Ser Gln Leu Gln Val
 725 730 735
 Glu Ser Arg Pro Leu Gln Asn Gly Ala Ser Ile Thr Gly Thr Ser Val
 740 745 750
 Val Thr Val Ser Gln Ile Thr Pro Ile Gln Thr Ser Leu Ala Tyr Val
 755 760 765
 Lys Thr Ser Glu Thr Leu Lys Gln Asn Asn Arg Asp Ala Met Glu Leu
 770 775 780
 Lys Pro Asn Gly Gly Ala Glu Pro Lys Cys Leu Lys Val Asn Ser Pro
 785 790 795 800
 Ile Arg Met Lys Asn Gly Asn Gly Lys Gly Trp Leu Arg Leu Lys Asn
 805 810 815
 Asn Met Gly Ala His Glu Glu Lys Lys Glu Glu Trp Asn Asn Val Thr
 820 825 830
 Lys Ala Glu Ser Met Gly Leu Leu Ser Glu Asp Pro Lys Gly Ser Asp
 835 840 845
 Ser Glu Asn Ser Val Thr Lys Asn Pro Leu Arg Lys Thr Asp Ser Cys
 850 855 860
 Asp Ser Gly Ile Thr Lys Ser Asp Leu Arg Leu Asp Lys Ala Gly Glu
 865 870 875 880
 Ala Arg Ser Pro Leu Glu His Ser Pro Ser Gln Ala Asp Ala Lys His
 885 890 895
 Pro Phe Tyr Pro Ile Pro Glu Gln Ala Leu Gln Thr Thr Leu Gln Glu
 900 905 910
 Val Lys His Glu Leu Lys Glu Asp Ile Gln Leu Leu Ser Cys Arg Met
 915 920 925
 Thr Ala Leu Glu Lys Gln Val Ala Glu Ile Leu Lys Leu Leu Ser Glu
 930 935 940
 Lys Ser Val Pro Gln Thr Ser Ser Pro Lys Pro Gln Ile Pro Leu Gln
 945 950 955 960
 Val Pro Pro Gln Ile Pro Cys Gln Asp Ile Phe Ser Val Ser Arg Pro
 965 970 975
 Glu Ser Pro Glu Ser Asp Lys Asp Glu Ile Asn Phe
 980 985

<210> 13
 <211> 532
 <212> PRT
 <213> Mus musculus

<400> 13
 Met Thr Thr Arg Lys Ala Gln Glu Ile His Gly Lys Ala Pro Gly Gly
 1 5 10 15
 Ser Val Ser Thr Gly Val Gly Thr Ala Glu Gly Ala Pro Ser Pro Ala
 20 25 30
 Gly Val Thr Pro Pro Pro Pro Arg Pro Gly Arg Thr Phe His Ala
 35 40 45
 Ile Phe Thr Arg Arg His Arg Thr Pro Asp Trp Gly Gly Cys Gly Val
 50 55 60
 Gly Ala Thr Arg Pro Phe Thr Gly Arg Pro Gly Cys Ala Arg His Gly
 65 70 75 80
 Ala Thr Val Pro Ala Ala Leu Arg Cys Cys Glu Arg Leu Val Leu Asn
 85 90 95
 Val Ala Gly Leu Arg Phe Glu Thr Arg Ala Arg Thr Leu Gly Arg Phe
 100 105 110
 Pro Asp Thr Leu Leu Gly Asp Pro Val Arg Arg Ser Arg Phe Tyr Asp

115	120	125
Gly Ala Arg Ala Glu Tyr Phe Phe Asp Arg His Arg Pro Ser Phe Asp		
130	135	140
Ala Val Leu Tyr Tyr Gln Ser Gly Gly Arg Leu Arg Arg Pro Ala		
145	150	155
His Val Pro Leu Asp Val Phe Leu Glu Glu Val Ser Phe Tyr Gly Leu		
165	170	175
Gly Arg Arg Leu Ala Arg Leu Arg Glu Asp Glu Gly Cys Ala Val Ala		
180	185	190
Glu Arg Pro Leu Pro Pro Pro Phe Ala Arg Gln Leu Trp Leu Leu Phe		
195	200	205
Glu Phe Pro Glu Ser Ser Gln Ala Ala Arg Val Leu Ala Val Val Ser		
210	215	220
Val Leu Val Ile Leu Val Ser Ile Val Val Phe Cys Leu Glu Thr Leu		
225	230	235
Pro Asp Phe Arg Asp Asp Arg Asp Asp Pro Gly Leu Ala Pro Val Ala		
245	250	255
Ala Ala Thr Gly Ser Phe Leu Ala Arg Leu Asn Gly Ser Ser Pro Met		
260	265	270
Pro Gly Ala Pro Pro Arg Gln Pro Phe Asn Asp Pro Phe Val Val		
275	280	285
Glu Thr Leu Cys Ile Cys Trp Phe Ser Phe Glu Leu Leu Val His Leu		
290	295	300
Val Ala Cys Pro Ser Lys Ala Val Phe Phe Lys Asn Val Met Asn Leu		
305	310	315
Ile Asp Phe Val Ala Ile Leu Pro Tyr Phe Val Ala Leu Gly Thr Glu		
325	330	335
Leu Ala Arg Gln Arg Gly Val Gly Gln Pro Ala Met Ser Leu Ala Ile		
340	345	350
Leu Arg Val Ile Arg Leu Val Arg Val Phe Arg Ile Phe Lys Leu Ser		
355	360	365
Arg His Ser Lys Gly Leu Gln Ile Leu Gly Gln Thr Leu Arg Ala Ser		
370	375	380
Met Arg Glu Leu Gly Leu Leu Ile Phe Phe Leu Phe Ile Gly Val Val		
385	390	395
Leu Phe Ser Ser Ala Val Tyr Phe Ala Glu Val Asp Arg Val Asp Thr		
405	410	415
His Phe Thr Ser Ile Pro Glu Ser Phe Trp Trp Ala Val Val Thr Met		
420	425	430
Thr Thr Val Gly Tyr Gly Asp Met Ala Pro Val Thr Val Gly Gly Lys		
435	440	445
Ile Val Gly Ser Leu Cys Ala Ile Ala Gly Val Leu Thr Ile Ser Leu		
450	455	460
Pro Val Pro Val Ile Val Ser Asn Phe Ser Tyr Phe Tyr His Arg Glu		
465	470	475
Thr Glu Gly Glu Ala Gly Met Tyr Ser His Val Asp Thr Gln Pro		
485	490	495
Cys Gly Thr Leu Glu Gly Lys Ala Asn Gly Gly Leu Val Asp Ser Glu		
500	505	510
Val Pro Glu Leu Leu Pro Pro Leu Trp Pro Pro Ala Gly Lys His Met		
515	520	525
Val Thr Glu Val		
530		